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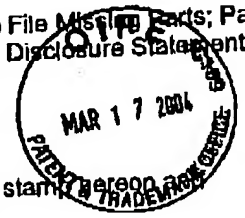
Application No. 10/722,380; Filing Date 11/25/2003
Inventor(s): Meyer et al.; Title of Invention: Multicomponent Fiber Including A Luminescent Colorant
Documents Enclosed: Response to Notice to File Missing Parts; Part 2 of Formalities Letter; Declaration; Information Disclosure Statement; PTO-1449 Form including 5 references

Check Enclosed $655.00



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Attorney's Docket No. 038675/270589 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Meyer et al.	Confirmation No.:	4624
Appl. No.:	10/722,380	Art Unit:	1711
Filed:	11/25/2003		
For:	MULTICOMPONENT FIBER INCLUDING A LUMINESCENT COLORANT		

March 15, 2004

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INFORMATION DISCLOSURE STATEMENT
CITATION UNDER 37 C.F.R. § 1.97

Sir:

Attached is a list of documents on form PTO-1449. In accordance with the Office waiver published July 11, 2003, copies of the cited U.S. patents and patent application publications are not enclosed. Applicant does enclose copies of any cited foreign patent documents and non-patent literature in accordance with 37 CFR 1.98(a)(2).

It is requested that the Examiner consider these documents and officially make them of record in accordance with the provisions of 37 C.F.R. § 1.97 and Section 609 of the MPEP. By submitting the listed documents, Applicant in no way makes any admission as to the prior art status of the listed documents, but is instead submitting the listed documents for the sake of full disclosure.

Respectfully submitted,

Melissa B. Pendleton
Registration No. 35,459

Customer No. 00826
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Charlotte Office (704) 444-1000
Fax Charlotte Office (704) 444-1111

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Grace R. Rippy

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(Revised 04/2003)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	10/722,380
Filing Date	November 25, 2003
First Named Inventor	Meyer et al.
Group Art Unit	1711
Examiner Name	
Attorney Docket Number	038675/270589

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear
	1	US-2,382,355	08/14/1945	Warren, Jr.	
	2	US-2,787,558	04/02/1957	Wadely	
	3	US-3,608,298	09/28/1971	Schoots	
	4	US-4,546,042	10/08/1985	Quon	
	5	US-4,623,579	11/18/1986	Quon	
	6	US-5,321,069	06/14/1994	Owens	
	7	US-5,424,006	06/13/1995	Murayama et al.	
	8	US-5,478,628	12/26/1995	Billingsley et al.	
	9	US-5,674,437	10/07/1997	Geisel	
	10	US-5,686,022	11/11/1997	Murayama et al.	
	11	US-5,695,853	12/09/1997	Billingsley et al.	
	12	US-5,741,590	04/21/1998	Kobsa et al.	
	13	US-6,375,864	04/23/2002	Phillips et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials	Cite No.	Foreign Patent Document Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached
	14	JP 06 033318 A	02/08/1994	Mitsubishi Rayon Co	Abstract	
	15	JP 04 034016 A	02/05/1992	Toray Ind Inc		Yes
	16	JP 06 128807 A	05/10/1994	Mitsubishi Rayon Co	Abstract	
	17	JP 09 269415 A	10/14/1997	Fujitsu Kasei KK Tokyo Electric Power Co. Inc.	Abstract	
	18	JP 06 273227 A	09/30/1994	Tokyo Electric Power Co Inc.	Abstract	

Examiner Signature		Date Considered	

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.CI-T01/4624386v1

(19) JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: 06128807 A

(43) Date of publication of application: 10. 05 . 94

(51) Int. Cl D01F 1/10
D01F 6/44
D01F 6/46
D01F 8/06

(21) Application number: 04304729

(22) Date of filing: 16 . 10 . 92

(71) Applicant: MITSUBISHI RAYON CO LTD

(72) Inventor: SHIMIZU YOSHISHIGE
KODAMA MITSUHIRO

(54) FLUORESCENT COLOR-DEVELOPABLE PIGMENT FIBER AND ITS PRODUCTION

(57) Abstract:

PURPOSE: To provide a pigmented fibers useful in the field needing fluorescent color(s) with high decorativeness such as interior decoration, consisting of conjugate fibers with the single fiber made up of a thermoplastic resin incorporated with a specified amount of a pigment and a thermoplastic resin incorporated with special metallic compound(s) emitting fluorescent color(s) under ultraviolet light irradiation.

CONSTITUTION: The pigmented fibers consisting of conjugate fibers with the single fiber made up of (A) as core, a thermoplastic resin (e.g. polypropylene) containing 0.5-20wt.% of at least one kind of special metallic compound selected from compounds of formula I, formula II and formula III, emitting blue, green, and red fluorescent colors, respectively, under ultraviolet light irradiation and (B) as sheath, a thermoplastic resin free from the above metallic compounds, but incorporated with 0.01-2.0wt.% of a pigment (e.g. cyanine-based blue). The pigmented fibers can be obtained by conjugate spinning at the core/sheath ratio of (1:1) at a core extruder temperature of 190-200°C and a sheath extruder temperature of 210-230°C followed by drawing. The pigmented fibers of the present invention give excellent fluorescent color(s) and can widely be used in the fields needing fluorescent colors with high decorativeness such as interior decoration.

(19) JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: 08269415 A

(43) Date of publication of application: 14 . 10 . 97

(51) Int. Cl G02B 6/00

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(22) Date of filing: 02 . 04 . 96

(71) Applicant: FUJITSU KASEI KK TOKYO ELECTRIC POWER CO INC:THE FUJI ELECTRIC CO LTD

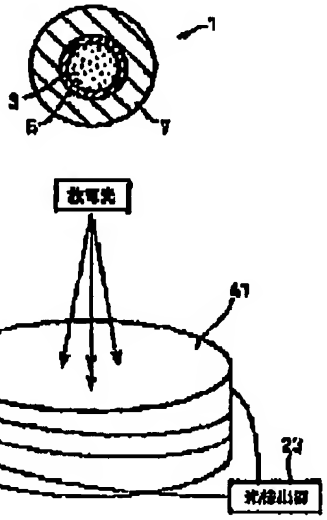
(72) Inventor: KURDSAWA KIYOSHI
TANAKA AKIRA
HATAKEYAMA YOSHIFUMI

(54) FLUORESCENT FIBER AND LIGHT CONVERGENT UNIT

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a fluorescent fiber having high fluorescent conversion efficiency and excellent for heat resistance and corrosion resistance and a convergent unit incorporating it.

SOLUTION: The fluorescent fiber 1 is constituted so as to contain a core 3 formed by norbornene system resin containing fluorescent coloring matter and a clad 5 provided on the outside of the core 3 and with a refractive index lower than the core 3. A photodetector 23 is connected to at least one end of such a fluorescent fiber 1 directly or indirectly, and a transparent or translucent light convergent body 41, etc., is arranged on the side of the fluorescent fiber 1, and the convergent unit is constituted so that the light fluorescent converted by the convergent body 41, etc., is led by the fluorescent fiber 1 to be fluorescent converted again.



(19) JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: 06273227 A

(43) Date of publication of application: 30 . 09 . 94

(51) Int. Cl G01J 1/02
G02B 6/00

(21) Application number: 05060365

(22) Date of filing: 19 . 03 . 93

(71) Applicant: TOKYO ELECTRIC POWER CO INC:THE FUJITSU LTD FUJI ELECTRIC CO LTD

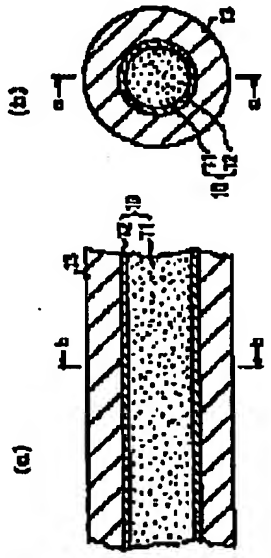
(72) Inventor: KUROSAWA KIYOSHI
WATANABE WATARU
YOSHIDA SATORU
TANAKA AKIRA
WATANABE KOJI
KOJIMA YUJI
FUJII KIYOSHI
YAMADA MAMORU
SHIGA SATORU

(54) OPTICAL FIBER CONVERGING UNIT

(57) Abstract:

PURPOSE: To provide an optical fiber converging unit which is not corroded by a HF gas generated in a gas insulating device and has a good converging effect and mountability.

CONSTITUTION: An optical fiber converging unit, which consists of a fluorescent fiber 10 containing fluorescent coloring matter and a photo detector provided on the end face of the optical fiber via at least one side end face of the optical fiber or a transmitting optical fiber, fluorescence-converts incident light from the side face of the fluorescent fiber 10 so as to lead it to the photo detector, and a transparent protecting layer 13, which has a corrosion resistance and a heat resistance, is provided on the surface of the fluorescent fiber 10 in the optical fiber converging unit.



TRANSLATION

(19) Japanese Patent Office (JP)

(12) Japanese Patent Official Gazette (A)

(11) Publication Number: H04-34016

(43) Date of Publication: February 5, 1992

(51) Int. Cl.[5]	Identifier	Interoffice No.	FI	Technology ID.
D 01 F	8/12	Z 7199-3B		
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D 06 P	3/87	7306-4H		
	5/00 120	C 7306-4H		

Examination required? Not yet. Number of Claims: 1 (Total of 5 pages)

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(54) Title of the Invention: **Pearly Conjugate Fibers**

(21) Application Number: H02-132126

(22) Filing Date: May 22, 1990

(72) Inventors: Keiji Okamoto
Shiga Office, Toray Kabushiki Kaisha
1-1, Sonoyama 1-chome, Otsu, Shiga, Japan
Yoshiteru Hasegawa
Shiga Office, Toray Kabushiki Kaisha
1-1, Sonoyama 1-chome, Otsu, Shiga, Japan
Kazuya Hayashi
Shiga Office, Toray Kabushiki Kaisha
1-1, Sonoyama 1-chome, Otsu, Shiga, Japan

(71) Applicant: Toray Kabushiki Kaisha
2-2-1, Nihonbashi Muromachi, Chuo-ku, Tokyo, Japan

H04-34016

TRANSLATION
SPECIFICATION

1. TITLE OF THE INVENTION
PEARLY SHADE CONJUGATE FIBER

2. WHAT IS CLAIMED IS:

Claim 1: A pearly shade conjugate fiber constructed with a sheath part made of a polyamide and a core part made of a sulfonated aromatic dicarboxylic acid denatured polyester, said conjugate fiber being dyed with a mixture of cationic type fluorescent brightener and an acidic chromatic dye, wherein a degree of exhaustion of said cationic type fluorescent brightener in said sheath part is 10% or less than that in said core part, and a degree of exhaustion of said acidic chromatic dye is 0.002 – 0.05 % owf of that of said polyamide in said sheath part.

3. DETAILED DESCRIPTION OF THE INVENTION

[TECHNICAL FIELD]

The present invention relates to a pearly shade conjugate fiber, which is different from conventional iridescent colored fibers in that allochlomy is created by a chromatic color and fluorescent whiteness in a monofilament.

[RELATED ART]

Conventional iridescent fabrics that give different hues at different viewing angles have been made by selecting fibers having different hues derived from different degrees of exhaustion for each weft and warp. Alternately, ready-died yarns having allochlomy [of different hues] were assigned to each weft and warp.

Iridescent fabrics [thus obtained] were mainly of chromatic shades, and [the prior art technology] could not be accountable for providing allochlomy for fabrics of non-

chromatic color. Moreover, the abovementioned methods could not be applied to knitted fabrics.

Alternately, it is possible to obtain conjugate spin fibers made of a polyamide represented by Nylon 6 and Nylon 66 and sulfonated aromatic dicarboxylic acids denatured polyester, and dye the resulting fibers with a mixture of a cationic type dye and an acidic dye to provide allochlomy. However, [this method has a drawback in that] any structure of the conjugate fiber, including a side-by-side type, and a concentric or eccentric core-to-sheath conjugate type, when the two components are dyed with chromatic dyes or a combination of white and chromatic dyes, the resulting color turns into an intermediate color derived from each of the dye colors without allochlomy.

[PROBLEMS THE INVENTION INTENDS TO SOLVE]

The objective of the present invention is to provide a pearly shade conjugate fiber that emits light chromatic color according to different curvatures created within the fabric while maintaining fluorescent whiteness of the fluorescent brightener.

[MEANS TO SOLVE THE PROBLEMS]

The present invention provides the following solutions to the abovementioned problems. That is, the present invention is a pearly shade conjugate fiber constructed with a sheath part made of a polyamide and a core part made of a sulfonated aromatic dicarboxylic acid denatured polyester, and the conjugate fiber is dyed with [a mixture of] a cationic type fluorescent brightener and an acidic chromatic dye. A degree of exhaustion of a cationic type fluorescent brightener in the sheath part is 10% or less than that in the core part, and a degree of exhaustion of the acidic chromatic dye is 0.002 – 0.05 % owf of that of a polyamide in the sheath part.

The polyamide of the present invention is represented by poly (ε-capramide) (Nylon 6), poly (hexamethylenecadipamide) (Nylon 66) which are obtained from monomers capable of copolymerization such as laurolactum, sebacate, para-xylenediamine, isophthalate, and the like, or a copolymer polyamide of these monomers.

Alternately, the polyamide of the present invention may be a denatured polyamide bonded with a compound having a sulfonic group in a part of the polyamide chain or the terminal. Alternately, the polyamide of the present invention may be a compound having a sulfonic compound. Further, the polyamide of the present invention may be a denatured polyamide obtained by adding sulfonated aromatic dicarboxylic acid as a free acid or alkylester during polyamide copolymerization.

Representative sulfonated aromatic dicarboxylic acids include 5 - sulfoxyisophthalic acid expressed by the following chemical formula (I) and its salt.

[I]

To benefit from effects of denaturation while maintaining the inherent mechanical properties of a base polyamide, the desirable content of sulfonated aromatic dicarboxylic acid copolymers is 0.25 - 3 mol % of base polyamide monomers.

The denatured polyamide may contain a delustering agent such as titanium oxide or the like. However, in order to fully transmit the color in the core polyester to give excellent brightness, it is desirable that the denatured polyamide be substantially free from delustering agent, pigments or the like.

Moreover, the polyamide may contain an antistatic agent, a heat resisting agent, and a light resisting agent, or the like, as long as the addition is limited to the amount that does not significantly diminish light transmittivity.

The denatured polyester used for a core part of the present invention is the type in which a compound having a sulfonic group is included in a part of the polyester chain or the terminal. An example of denatured polyester is disclosed in Japanese Examined Patent (Kokai) No. S34-10497. The denatured polyester is made by further

copolymerizing readily copolymerized polyester, whose major ingredients comprise polyethylene terephthalate, polybutylene terephthalate or their copolymers, with sulfonated aromatic dicarboxylic acid or its salts.

An example of a representative sulfonated aromatic dicarboxylic acid is 5-sulfoxyisofuthalate expressed by the prior chemical formula (1) or salts thereof.

A dicarboxylic acid is added during polyester polymerization as a free acid or alkylester to yield denatured polyester. The desirable amount of sulfonated aromatic dicarboxylic acid used for copolymerization is about 0.5 - 6 mol % of terephthalate. When the amount used for copolymerization is too small, it is difficult to obtain the desired effect from the resulting denatured polyester. When the amount is too large, the crystal structure of the resulting denatured polyester will deteriorate, thereby causing unfavorable results such as a significant decrease in mechanical properties.

Note that the denatured polyester may contain an antistatic agent, a light resisting agent, a heat resisting agent, a delustering agent, or the like.

The cationic type fluorescent brightener of the present invention selectively exhausts a sulfonic acid group or a carboxylic acid group, or the like. Examples of the fluorescent brightener include Uvitex BAC (Trade Name: manufactured by Japan Chiba-Geigy), Hostalux NR (Trade Name: manufactured by Hoechst Japan), Mikawhite ACR Liq. (Trade Name: manufactured by Nippon Kayaku and Mitsubishi Kasei Kogyo), and the like. However, the cationic type fluorescent brightener of the present invention is not limited to only the stated types.

The acidic dye of the present invention includes Diacid (Trade Name: manufactured by Mitsubishi Kasei Kogyo), Kayacyl and Kayanol (Trade Names: manufactured by Nippon Kayaku), Mitsui Nylon (Trade Name: Mitsui Toatsu Kagaku) and the like. However, the acidic dye of the present invention is not limited to these.

The conjugate fiber of the present invention is a core-to-sheath type conjugate fiber having a core part and a sheath part. The sheath component is made of a polyamide as described above while the core part is made of denatured polyester as described above.

The core-to-sheath ratio can take any numerical values as long as the effect of the present invention is obtained. Nonetheless, in view of obtaining a uniform and stable coating and further obtaining a desirable whiteness by fully whitening polyester constituting the core part, it is desirable that the polyester be 20 - 75 weight % of polyamide.

Although the polyamide sheath part and denatured polyester core part may be arranged in a concentric manner, an eccentric arrangement provides a wide variety of hues, which makes an eccentric arrangement more desirable. Regarding the cross section of a monofilament for a core-sheath type conjugate fiber, a desirable shape is found to be in order a polygon, a triangle, or a circle. However, an unusual cross section may make the sheath part very thin and friable. For this reason, one must take the thickness of the sheath [part] into account when setting the core-to-sheath ratio. Figures (a) – (f) illustrate desirable examples.

In view of obtaining full whiteness, preventing a yellowish glow, and preventing loss of whiteness upon addition of chromatic dyes to a fluorescent brightener, the desirable degree of exhaustion of a cationic type fluorescent brightener in the core part polyester is 0.2-2.5 % owf. A 0.4-1.4 % owf is even more desirable. Herein, the unit for the degree of exhaustion (% owf) is the degree of cationic type fluorescent brightener exhausted in the core part denatured polyester.

A small amount of a cationic type fluorescent brightener may be exhausted in the sheath part polyamide as long as the cationic type fluorescent brightener exhausts at 10% or less in the core part denatured polyester. When the cationic type fluorescent brightener exhausting or contaminating the sheath part polyamide exceeds 10%, the resulting pearly tone is deteriorated.

The degree of exhaustion of an acid chromatic dye in the sheath part polyamide must remain within a range of 0.002-0.05 % owf. At a degree greater than 0.002 % owf, the product obtains a tone similar to that derived from chromatic fluorescent dyes, which is far from a pearly white tone. In contrast, when the degree of exhaustion is too small, the product cannot give a variety of shades that must be noticed to accomplish the object

of the present invention. The unit "% owf" expressing the degree of exhaustion is defined as the amount of acid chromatic color dye exhausted in the sheath part polyamide of a monofilament.

One can obtain a yarn or a textile from the resulting core-sheath type conjugate fiber spun by the normal method and further dye the yarn or textile according to the present invention to make a fabric of interest.

First, a polyamide and a denatured polyester are separately melted and guided to a spinning-package part where [the two different materials] are conjugated by a normal method in a core-sheath structure to produce a conjugate flow, which is then extruded through a nozzle.

The resulting filament is taken up at a given speed and provided with an oil to be wrapped up in a package [SIC: SPOOL]. Then, a spool of yarn is drawn using a draw-twister by a normal method to provide a desired strength and flexibility. Instead of winding after extrusion, the yarn may be continuously drawn before winding. In addition, the yarn may be taken up at 4000 m/min or faster to obtain a desired fiber performance instantly.

In an example of the direct spinning-drawing method, a spun yarn is taken up and continuously extruded at 100-5000 m/min and drawn at 3500 – 5500 m/min followed by heat fixation.

Now, the degree of exhaustion in the sheath part and the core part is computed by the following methods:

<Degree of Exhaustion of the Sheath Part>

A given amount (200 mg) of dyed spun fiber or a dyed fabric made of the dyed spun yarn is weighed and placed in 30ml of 88% formic acid solution at 30 °C for three minutes to dissolve the sheath part polyamide and dyes exhausted therein. The degree of light absorption is measured at the maximum absorption wavelength using a "Spectrophotometer" (Model: U-3400 manufactured by Hitachi Kabushiki Kaisha).

Also, a given amount (200 mg) of an un-dyed sample is weighed and placed in 30ml of 88% formic acid solution at 30 °C for three minutes with a given amount (0.25 mg, 0.5 mg, or 1.0 mg) of dye to dissolve both materials. The degree of exhaustion is measured using a spectrophotometer or colorimeter. Obtained data points were plotted to illustrate the relationship between degrees of light absorption of the dye itself and degrees of exhaustion in a standard curve. Numerical values of the degree of exhaustion (a % owf) are obtained using the standard curve based on the numerical values of degrees of light absorption of the sheath part polyamide.

<Degree of Exhaustion of the Core Part>

First, conjugate fibers or a fabric made from the conjugate fibers is dissolved and the sheath part polyamide is removed therefrom. The residue is washed with water. A given amount (100 mg) of the residue from the dyed fibers is weighed and placed in 30 ml solution of phenol / ethane tetrachloride (at 3:2 weight %) mixture and dissolved completely at 60 °C. The light absorption level at the maximum wavelength is measured using the above colorimeter. A standard curve is obtained to illustrate the relationship between degrees of light absorption and degrees of exhaustion. The numerical value of the degree of exhaustion (wt% owf) of the core part denatured polyester resulting from actual dyeing is obtained using the standard curve.

Hence, the degree of exhaustion of the sheath part with respect to that of the core part is obtained by the formula (a / b) x 100 where the degree of exhaustion of the sheath part is a% owf and the degree of exhaustion of the core part is b % owf.

The pearly allochlomic effect was evaluated by four panel members who provided visual inspection using three grading scales:

O: Good, Δ: Fair, X: Poor

The present invention is described in detail with reference to the Working Examples herein.

[WORKING EXAMPLES]

A polyethylene terephthalate raw material comprising ethylene glycol and terephthalate was prepared as a raw material. 5-sulfoxyisofumarate at 1.5 mol% of terephthalate was added to the raw material with a catalyst for polymerization according to a normal method. A denatured polyethylenetherephthalate (hereinafter referred to as "denatured polyester") having an ortho-chlorophenol ultimate viscosity (IV) of 0.64 was thus obtained.

The resulting denatured polyester and nylon 6 substantially free from titanium oxide having a sulfuric acid-relative viscosity of 2.62 were extruded by an extruder type conjugate spinning machine and separately melted. The melt fibers were weighed to obtain an equal amount of each, and were then guided to a conjugate spinning-package part where the denatured polyester [flow] formed a core while nylon 6 [flow] formed a sheath [part], thus together making a conjugate flow, which was then extruded through a nozzle. The resulting yarn was taken up at 1500 m / min and thermally fixed at 160 °C using a heat-roller followed by winding at 4000 m / min. A strand of drawn yarn of 70 denier / 24 filaments was thus obtained. The core-to-sheath ratio of the resulting conjugate fiber was 1:1.

Using the drawn yarn for warp and weft, a flat textile (warp density: 118 warps/ inch; weft density: 85 wefts / inch) was woven. The textile was placed in a bath containing 2g / liter of Sundebt G-29 (Phonetic Translation of the Trade Name: manufactured by Sanyo Kasei), 5g / liter of anhydrous sodium carbonate, 2g / liter of Tetroll WR-14 (Trade Name: manufactured by Meisei Kagaku Kogyo) and scoured to remove starch [and the like] at 98 °C for 20 minutes. The textile was then dried followed by intermediate fixation at 170 °C. Sample fabrics for dyeing tests were thus obtained.

Working Example 1

Sample fabrics were placed in a bath containing 0.5 % owf (1% owf to the core part denatured polyester) of fluorescent brightener Uvitex BAC (Trade Name:

Manufactured by Ciba-Geigy) and a 0.5 cc / liter of acetic acid as a promoter, and dyed at 110 °C for 30 minutes.

Next, [two types of] baths were prepared: a bath containing Mitsui Acid Mill Turq. Blue 3G (Trade Name: Manufactured by Mitsui Toatsu Senryo) at 0.01 % owf of a total fabric (0.02 % owf of the sheath part polyamide) for use in Working Example 1. Another bath containing Mitsui Acid Mill Turq. Blue 3G (Trade Name: Manufactured by Mitsui Toatsu Senryo) by 0.1 owf of a total fabric (0.2 % owf of the sheath part polyamide) for use in Comparative Example2. A 0.5 cc / liter of acetic acid was then used as a promoter [for each bath]. The samples were dyed in the baths at 98 °C for 30 minutes.

The resulting fabrics from Working Example 1 and Comparative Example 1 were given to four panel members for visual inspection for the presence of a pearly allochlomy. In addition, the degree of exhaustion was measured for the core part and the sheath part. The results are illustrated in Table 1.

TABLE 1

	Degree of Exhaustion of Fluorescent Brightener*		Degree of Exhaustion of Core Part Chromatic Dye	Pearly Allochlomy Evaluation Result
	Core Part	Sheath Part		
Working Example 1	0.841	0.0003	0.0174	O
Comparative Example 1	0.842	0.0003	0.186	X

* The unit of the degree of exhaustion is % owf.

As is apparent from Table 1, when the chromatic dye concentrates too much in the sheath part, the chromatic hue is enhanced therein, and as a result allochlomy cannot be observed.

In Working Example 1 where an appropriate amount of chromatic dye is present in the sheath part, a light blue tone appears against a pure-white back ground, providing elegant and restful pearly allochlomy.

The fabric provided an outstanding effect outdoors where it was exposed to strong ultraviolet under the sunlight.

[ADVANTAGEOUS EFFECTS OF THE INVENTION]

The conjugate fibers that are dyed according to the present invention provide textile products that change their pure white color to a white tint with a light chromatic color depending on the incident angle of light. In addition, the denatured polyester layer contained in the core part provides consistency in size [SIC: ANTISHRINKAGE] and anti-wrinkle characteristic[s] with an appearance of favorable tension and tenacity. Moreover, the conjugate fibers overcome the lack of light resistance of conventional fabrics made of polyamide fibers with fluorescent brighteners. Furthermore, since the conjugate fibers of the present invention contain polyamide in a sheath part, they provide the good abrasion resistance and machinability as those of polyamide fiber fabrics.

The above characteristics find desirable applications of the conjugate fibers of the present invention in clothing (blouses, blousons etc.), sport ware for skiing tennis, or the like.

4. BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 (a)-(f) illustrate desirable cross sections for pearly shade conjugate fibers of the present invention.

In the figure, the following reference symbols are used:

1: sheath-part polyamide; and

2: core-part denatured polyester.

Applicant: Toray Kabushiki Kaisha

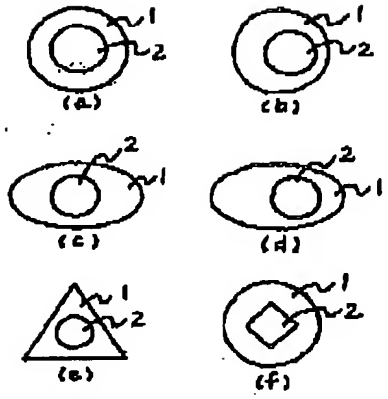

Figure 1

Translator's Note:
The term "degree of exhaustion" as utilized in this document is the ionic saturation of the cationic type dye or brightener in the core part or sheath part of the polyamide fibers of the present invention.